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Government; A. Pannekoek, Untersuchungen über den Lichtwechsel Algols, presented by the author; Sydney A. Roberts, Azimuths of the north pole star, latitude 38° to 55° N., for use until the year 1915, presented by the author; Société Belge d'Astronomie, Bulletin, vols. i.–viii., presented by the Society; H. J. Zwiers, Recherches sur l'orbite de la Comète périodique de Holmes, presented by the Leiden Observatory

Drawing of curves of sun-spots and magnetic elements, 1841–96, presented by William Ellis; Drawings of sun-spots, 1850–1865, by J. H. Griesbach, presented by Henry Eichbaum.

Photographs of Comet *Perrine* &c., presented by V. Nielsen; Photographs of the Moon and Nebulæ taken by G. W. Ritchey with the 40-inch refractor and the 24-inch reflector (lantern slides and transparencies), presented by the Yerkes Observatory.

## *Letter from Mr. S. C. Chandler proposing the Establishment of a Southern Belt of Latitude Stations.*

*To the Royal Astronomical Society.*

16 *Craigie Street, Cambridge, Mass.*

I beg to submit a statement with regard to a new problem that has arisen above the astronomical horizon within the past year, and to suggest, as a practical means for its possible solution, a proposition which it seems peculiarly fitting that the Society should take into consideration, for reasons that will presently appear

I will limit the present statement of the problem in question to its general features. Its history is very short. In the course of the researches for the establishment by observation of the relative motions of the Earth's axes of figure and rotation, commonly known as the variation of latitudes, there has emerged to view quite unexpectedly an entirely distinct phenomenon. The range of its effect is small, but the evidence of its existence is too definite to permit us to assume that it is not real without the most searching examination. Whether subjective or objective, its origin must be found before we can confidently complete the analysis of the motion of the poles with which it appears entangled in the observations. Its existence is the ingenious discovery of Mr. Kimura, of the International Latitude Station at Mizusawa, Japan, and was announced by him in No. 517 of the *Astron. Journal* (1902 Feb. 14), and in No. 3783 of the *Astron. Nachrichten* (1902 April 5). The only other literature pertaining to it will be found in *A. J.*, 524, and *A. N.*, 3808, and more recently in *A. J.*, 530. All the known facts with regard to it may there be readily examined, so that it is not necessary here to go into particulars. A sufficient description of

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it is, that it is a small residual phenomenon with a total range of 0″·08, independent of the longitude of the meridian in which it is observed, but regularly variable with the time of the year, its maximum and minimum values being attained about January 1 and July 1. It is too pronounced and regular in its course to be ascribed to fortuitous arrangement of residuals. Consequently, whether it arises from some systematic error of observation or from some unknown but real cause, its explanation must be found.

In the paper last quoted I have endeavoured to examine two questions: first, whether it may be attributed to the effect of stellar parallax; secondly, whether it may be due to an annual vibration of the Earth's centroid in the line of the terrestrial axis. I have shown that the first explanation would lead to what appear, according to our present notions, to be improbable values of the average parallaxes of the stars employed; and that the second explanation requires a motion in the centroid of an amount that I suppose would be regarded as equally unlikely. I can imagine no other cause that will intelligibly account for the observed effect. Unknown anomalies in refraction may be responsible, but it is not easy to formulate the action of such an agency. Finally we have the possibility that the existing scheme of observation in the international belt of six stations in latitude +39° is defective. Our only resource for further investigation of this subject, which I suppose must be attempted unless we propose to stop short in face of the dilemma, is to enlarge and vary the present programme of operations. In the paper mentioned I have suggested the establishment of at least one additional belt, to be located in the southern hemisphere; and that two observers be provided for each station, so that the observations, instead of being confined to a few hours of each night, as in the present belt, shall embrace the whole diurnal arc between sunset and sunrise. It would be premature here to go into the details of arrangement, that being a matter for subsequent consideration, after it is decided that means for carrying out the project can be provided.

Now, the fact to which I desire to direct the attention of the Society is that there already exist observatories in the British Colonies, namely, at the Cape of Good Hope and at Sydney, N.S.W., admirably situated to serve as two stations of such a belt, so that if a third could be established about thirty miles south of Santiago de Chile, we should have a system extremely well adapted, both in longitude and latitude, for the purpose of a determinate solution of the coordinates of polar motion by observation of a common set of stars in the known way; and the duplication of the observers and prolongation of the observed arcs would with much likelihood provide the means for solving the new enigma of Kimura's phenomenon. At least there is apparently no other resource that presents more chances for its solution.

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This system of stations would be :—

| | Lat. | Long. | Difference. Lat. | Difference. Long. |
|---|---|---|---|---|
| | ° ′ | ° | ° ′ | ° ′ |
| Sydney ... | −33 52 | −151·2 | | |
| | | | 0 4 | 132 7 |
| Cape of Good Hope | −33 56 | − 18·5 | | |
| | | | 0 2 | 89 2 |
| Santiago (30 m. S.) | −33 54 | + 70·7 | | |

There are other grounds which make the establishment of such a belt in the southern hemisphere desirable. The phases of the annual term of the polar motion occur there in opposite climatic conditions to those in the northern belt.

The fact that two English colonial observatories are so fortunately situated, on the same parallel and in such advantageous difference in longitude, seems to make it appropriate that the Society should deliberately consider this proposition and, if it commends itself to them, lend their influence and encouragement to the undertaking of it under national auspices.

S. C. CHANDLER.

The foregoing letter was considered at the meeting of the Council of the Royal Astronomical Society (1903 March 13), and the following resolution was passed :—

That the Council of the Royal Astronomical Society is much impressed with the importance of establishing a Southern Belt of Latitude stations for two years at Sydney, the Cape of Good Hope, and near Santiago as proposed by Mr. Chandler, to investigate the subject of Mr. Kimura's term in the latitude variation, and considers it very desirable that this proposal should be carried into effect.

## *Velocity in the Line of Sight. Selected Stars. Cambridge Observatory, I.* 1902. By H. F. Newall.

The present note is a first contribution to the plan of co-operation recently inaugurated under the initiative of Professor E. B. Frost, of the Yerkes Observatory (*Astrophysical Journal*, 1902 October, xvi. 169), and contains (i) a brief statement of the instruments used at Cambridge ; (ii) notes as to the measurement of photographs and the reduction of results ; (iii) a few results relating to the velocity in the line of sight of three out of the ten stars selected for the purposes of co-operative observations as velocity-reference-stars.

If apology is needed for the presentation of such meagre results, it may be offered on the ground that it seems desirable